Chapter 5

Other Tactical Operations

Other tactical operations cover a wide range of special-purpose operations undertaken routinely during offensive and defensive operations. While these operations are not the main focus of the commander at the tactical level of war, smoke may support these operations as well. These operations include–

- Retrograde operations.
- Relief-in-place operations.
- Passage of lines.
- Linkup operations.
- Breakout from encirclement.
- River crossings.
- Obstacle breaching.

In addition, there are special conditions and environments we must consider:

- Mountains.
- Jungles.
- Urban terrain.
- Deserts.
- Winter zones.
- Nuclear, biological, and chemical (NBC) conditions.

Finally, because smoke draws attention, we must consider smoke support for tactical deception.

Tactics

Smoke and obscurants integrated throughout the battlefield and operational continuum provide major contributions to combat power in deep, close, and rear operations. In other operations, the major contributions are the same as those in offensive smoke tactics. See Chapter 3.

Smoke and obscurant use in other tactical operations requires the same careful planning and execution as with the offense and defense. In addition to the general techniques listed in Chapter 3, special techniques to minimize interference include –

- **Know the limitations of your delivery systems.** Smoke munitions do not behave the same in all conditions or environments (for example, the jungles of Central America versus the woodlands of Europe). Plan for differences in coverage. Some munitions combinations such as HE and WP are not effective under certain environments or conditions such as winter zones with deep snow.
- **Use smoke to mask terrain from aerial observation.** With the exception of jungles, much of the terrain described in this chapter affords good aerial observation. By masking key terrain features you reduce your vulnerability as targets of opportunity for high-performance aircraft.

Retrograde

A retrograde operation is a movement to the rear or away from the enemy.

Retrograde operations gain time, preserve forces, avoid combat under undesirable conditions, or draw the enemy into an unfavorable position. In retrograde operations–

- Use smoke to support maneuver by–
  – Concealing maneuvering forces from enemy observation.
  – Concealing disengaging and moving forces.
  – Providing tactical surprise and allowing the commander to set the terms of combat.
  – Allowing the commander to mass forces unobserved.
  – Defeating enemy surveillance efforts.
  – Supporting the deception story.
  – Slowing and disrupting enemy movement.
  – Isolating attacking echelons.
  – Concealing engineer operations defensive preparations to the rear
- Use smoke to provide additional firepower by–
  – Defeating enemy counterreconnaissance efforts.
  – Disrupting enemy command and control.
  – Disrupting enemy maneuver and reinforcement.
  – Disrupting the enemy's ability to communicate.
  – Forcing the enemy to mass, thus providing a lucrative target.
  – Changing friendly to enemy force ratios by using thermal imagers and

millimeter wave acquisition devices such as radars to see through visual smokes and using smoke to isolate defending and second-echelon forces.
– Enhancing friendly target acquisition efforts by silhouetting enemy vehicles with smoke and using smoke and obscurants we can see through but the enemy cannot.
- Use smoke to protect the force. (See Chapter 3 under Offensive Smoke Tactics.)

Delay

In delays, units give ground to gain time. Delaying units inflict the greatest possible damage on the enemy while preserving their freedom of action.

In the delay, use smoke to–
- Conceal movement of maneuver and support forces, allowing the commander to mass forces unobserved.
- Provide tactical surprise, allowing the commander to seize the initiative and set the terms of combat.
- Defeat enemy reconnaissance and counterreconnaissance efforts.
- Conceal obstacle emplacement, breaching, or crossing.
- Conceal designated withdrawal routes.
- Maintain contact with the enemy but preclude decisive engagement.

Smoke employment tactics in the delay are the following:
- **Screening smoke.** Use screening smoke to conceal maneuver and obstacle emplacement. Use smoke along withdrawal routes and along the flanks to conceal movement. Begin making smoke prior to departing your existing position to confuse the enemy as to the actual location and size of the force. Use projected means to deliver smoke between the delaying unit and the enemy force. Use smoke to conceal obstacle breaching or crossing. The priority of effort is to mobility operations; therefore, carefully control the smoke to prevent slowing or silhouetting your units.
- Protecting smoke. Use protecting smoke as required to defeat enemy ATGMs and air defense systems. Use protecting smoke to avoid decisive engagement.
- Obscuring smoke. Use obscuring smoke to defeat enemy reconnaissance and counterreconnaissance efforts. Use projected smoke means to deliver smoke mixed with high-explosive rounds before the enemy can pinpoint your units. Attempt to force the enemy into early deployment.
- Marking smoke. Use marking smoke to mark enemy targets for rapid destruction or to reduce the potential for firing on friendly forces.
- Smoke for deception . Use supporting smoke to draw attention to areas of little or no importance. Create large-area smoke away from the delaying force. Consider using smoke mixed with high-explosive rounds to conduct preparatory fire of dummy objectives.

Withdrawal

In withdrawals, a force in contact disengages from the enemy. The force may be assisted by another force or unassisted. In the withdrawal, use smoke to–
- Conceal movement of maneuver and support forces, allowing the commander to mass security forces unobserved.
- Defeat enemy reconnaissance and counterreconnaissance efforts.
- Conceal obstacle emplacement, breaching, or crossing and hinder pursuit by the enemy.
- Conceal designated withdrawal routes, traffic control points, and on-order assembly areas.
- Create opportunities to disengage the force.

Smoke employment tactics in the withdrawal include the following:
- Screening smoke. The tactics are the same as those under Delay. Additionally, use projected means to deliver smoke between the security force and the enemy force.
- Protecting smoke. The tactics are the same as those under Delay.
- Obscuring smoke. The tactics are the same as those under Delay.
- Marking smoke. The tactics are the same as those under Delay.
- Supporting smoke for tactical deception. Use supporting smoke to draw attention to areas of little or no importance. Create large-area smoke away from the main body.

Retirement

In a retirement, a force not in contact moves away from the enemy in an organized manner. In a retirement, a heavy rear guard will conduct delaying actions to slow the advance of the enemy and allow the main body to increase the distance between itself and the enemy. In general, use smoke to support the rear guard in its delaying operations. The tactics for employment of smoke in support of the rear guard are the same as for the delay.

Relief in Place

In a relief in place, a unit in contact is replaced by another that assumes the missions of the outgoing unit. Use smoke to–
- Fix the enemy reconnaissance force.
- Mark the enemy reconnaissance force for destruction with direct and indirect fire weapons.
- Deny the enemy reconnaissance force information about the disposition, composition, or intent of friendly forces.
- Conceal the movement of relieving forces. This is critical as dispersion of forces in a relief is difficult. The enemy may exploit the massing

as a time to attack with NBC weapons.

A special consideration for reliefs is to maintain the illusion the force has not changed. Obtain the relieved force's smoke annex. In planning the relief, attempt to duplicate patterns of employment for a brief period.

Smoke employment tactics in a relief in place are the following:

- Screening smoke. Use screening smoke to conceal maneuver. Use smoke in the reserve force area and along the flanks to conceal movement. Use smoke forward of the FLOT to allow the relieved force to disengage. You must carefully control the smoke to prevent silhouetting your units.
- Protecting smoke. Use protecting smokes to defeat enemy antitank and air defense systems.
- Obscuring smoke. Use projected smoke means to deliver smoke mixed with high-explosive rounds before the enemy can pinpoint your units. Plan obscuring fire based on decision points for the enemy, isolating and confusing their reconnaissance forces. Plan obscuring fire during the relief to allow the relieved force to disengage and pass through friendly lines unobserved.
- Marking smoke. Use marking smoke to mark enemy targets for rapid destruction or to reduce the potential for firing on friendly forces. Use aviation reconnaissance assets to spot the enemy reconnaissance force and mark it with smoke rockets.
- Supporting smoke for tactical deception. The tactics are the same as in the withdrawal phase.

Passage of Lines

A passage of lines is a coordinated movement of one or more units through another unit. Units conduct passage of lines to continue an attack or counterattack, envelop an enemy force, pursue a fleeing enemy, or withdraw a security or main battle force. Synchronization is the overriding imperative. Use smoke to—

- Conceal movement of maneuver and support forces, allowing the commander to mass forces unobserved.
- Provide tactical surprise, allowing the commander to seize the initiative and set the terms of combat.
- Defeat enemy reconnaissance and counterreconnaissance efforts.
- Conceal obstacle breaching or bypass.

Smoke employment tactics in passage of lines are the following:

- Screening smoke. Use screening smoke to conceal maneuver and obstacle breaching. Use smoke at the contact point, along passage lanes, and along the flanks to conceal movement. Use smoke forward of passage points. You must carefully control the smoke to prevent silhouetting your units.
- Protecting smoke. Use smoke to defeat enemy antitank and air defense systems.
- Obscuring smoke. Use projected smoke means to deliver smoke mixed with high-explosive rounds before the enemy can pinpoint your units. Plan obscuring fire based on decision points for the enemy, isolating and confusing their reconnaissance forces. Plan obscuring fire during the passage of lines to allow the force to pass through friendly lines unobserved.
- Marking smoke. The tactics are the same as those under Relief in Place.
- Supporting smoke for tactical deception. Use supporting smoke to draw attention to areas of little or no importance. Create large-area smoke away from the main body. Consider using smoke mixed with high-explosive rounds to conduct preparatory fire of dummy objectives.

Linkup Operations

Two friendly forces are joined in linkup operations. Units conduct linkup operations to complete an encirclement of an enemy force, assist in breakout of an encircled friendly force, or to join an attacking force with a force inserted into the enemy rear.

Use smoke to–

- Mark the coordinated fire line (CFL) or the restrictive fire line (RFL) to prevent fires being set by friendly forces.
- Conceal movement of the linkup force.
- Deny the enemy information concerning when and where the linkup will occur.

Smoke tactics for linkup operations are the following:

- Obscuring smoke. The tactics are the same as those for the exploitation phase of offensive operations (Chapter 3).
- Screening smoke. Use screening smoke to conceal maneuver and support forces and defeat enemy target acquisition and guidance systems. Use self-defense and generated-smoke means to conceal maneuver units as they bypass or harass enemy forces.
- Marking smoke. Use marking smoke to mark the CFL or RFL, mark targets for destruction, identify bypass routes, and signal for battlefield activities. Use projected smoke means to deliver smoke onto identified enemy strongpoints or larger formations and to signal forces to consolidate on a particular objective or rally point.
- Protecting smoke. If the enemy has known or suspected nuclear or directed-energy weapon capability,

concealing your logistics activities in oil smokes may attenuate some of the energy.

- Smoke for deception. Use this smoke to keep the enemy off-balance and to draw attention away from critical sustainment activities.

Breakout from Encirclement

A breakout from encircled forces differs from other attacks only in that units must maintain a simultaneous defense of other areas of the perimeter.

Use smoke to–

- Aid in establishing a deception story.
- Isolate and segregate enemy forces to create gaps or weaknesses in the encircling force.
- Conceal movement of maneuver and support, allowing the commander to mass the rupture force and main body unobserved.
- Defeat enemy reconnaissance and counterreconnaissance efforts.
- Conceal obstacle emplacement, breaching, or crossing and hinder pursuit by the enemy.
- Create opportunities to disengage the force.

Smoke employment tactics in breakout from encirclement include–

- Obscuring smoke . Use obsuring smoke to isolate the rupture objective, defeat enemy target acquisition and guidance systems, and defeat reconnaissance and counterreconnaissance efforts. Use projected smoke means to deliver smoke mixed with high-explosive rounds in front of the objective; between enemy formations; and on identified forward observer, ATGM, and tank unit positions before the enemy can pinpoint your units as targets.
- Screening smoke. Use screening smoke to conceal maneuver as you bypass, breach, or cross obstacles or small pockets of resistance, along the flanks to protect the force, and in the rear to conceal disposition and composition of both the reserves and rear guard. Use self-defense and generated-smoke means to deliver smoke across danger areas and to the flanks of the force to limit enemy observation and engagement.
- Marking smoke. Use marking smoke to mark enemy targets for rapid destruction or to reduce the potential for firing on friendly forces.
- Protecting smoke. If the enemy has known or suspected directed-energy weapon capability, concealing your force in a blanket of oil smoke will attenuate some of the energy.
- Smoke for deception. Use this smoke to draw attention away from the main effort to areas of little or no importance. Since the diversionary force is critical to the breakout, consider making it the priority for smoke support. Use generated-smoke means to create small- to large-area smokes away from the main body.

River Crossings

Units conduct river crossings as part of a higher headquarters scheme of maneuver. The commander's objective is to project his combat power to the exit side of the river quickly to maintain the unit's momentum. The overriding imperative is synchronization. Effective command and control are critical for success. Apply all techniques to minimize the interference caused by smoke. Use smoke to–

- Conceal the movement of the initial assault force.
- Isolate the exit bank of the river for rapid occupation by maneuver forces.
- Conceal emplacement of crossing means such as engineer bridges.
- Isolate follow-on objectives to allow the commander to rapidly project combat power across the river.

Smoke employment tactics in river crossings include—

- Screening smoke. Use screening smoke to conceal maneuver and actual river crossing sites. Use smoke in the main body area and along the flanks to conceal movement. You must carefully control the smoke to prevent silhouetting your units. Begin making smoke prior to conducting the initial assault to confuse the enemy as to the actual location and size of the force. Use projected-smoke means to deliver the initial screening smoke to isolate the exit bank objectives and give other smoke delivery means time to build effective smoke.
- Protecting smoke. Use protecting smoke as required to defeat enemy ATGMs and air defense systems.
- Obscuring smoke. The tactics are the same as in the preparation phase for offensive operations (Chapter 3).
- Marking smoke. Use marking smoke to mark enemy targets for rapid destruction or to reduce the potential for firing on friendly forces. Aviation assets can deliver smoke onto identified enemy positions for destruction by indirect fire or the follow-on force.
- Smoke for deception. The tactics are the same as in the preparation phase for offensive operations (Chapter 3).

Obstacle Breaching

Units breach obstacles when they cannot bypass them at an advantage. The commander's objective is to project his combat power to the exit side of the obstacle quickly to maintain the unit's momentum. The overriding imperative is initiative. In general, platoons and larger formations breach obstacles, with most smoke planning consisting of immediate fire requests for covert or hasty breaches or detailed planning for all potential smoke assets in deliberate breaches.

Use smoke to—

- Isolate the exit side objective.
- Conceal movement of the breaching, initial assault, and support forces.
- Conceal emplacement of crossing means such as engineer bridges or demolitions.
- Isolate the exit side of the obstacle for rapid occupation by maneuver forces.
- Isolate follow-on objectives to allow the commander to rapidly project combat power across the obstacle.

Smoke employment tactics for breaching include–

- Screening smoke. The tactics are the same as those under River Crossings.
- Protecting smoke. Use protecting smokes as required to defeat enemy ATGMs and air defense systems.
- Obscuring smoke. The tactics are the same as in the preparation phase for offensive operations (Chapter 3).
- Marking smoke. The tactics are the same as those under River Crossings.
- Smoke for deception. The tactics are the same as in the preparation phase for offensive operations (Chapter 3).

Special Conditions or Environments

Weather and terrain have a significant impact on smoke employment as previously stated. The following paragraphs present special climate considerations, employment tactics, and techniques to overcome difficulties under these conditions:

- Mountains.
- Jungles.
- Urban terrain.
- Deserts.
- Winter zones.
- Nuclear, biological, or chemical (NBC) conditions.

Mountains

In combat operations, mountains generally are characterized by rugged, compartmented terrain; steep slopes; and few natural or man-made lines of communication. The weather spans the entire spectrum from extreme cold, with ice and snow during winter, to extreme heat in some areas during summer. Although these extremes are important planning considerations, the variability of weather over short periods of time, and from area to area, also significantly influences maneuver, fire support, and smoke support operations.

Delivery Means

Mountainous terrain is generally hard and rocky in the summer with intermittent areas of deep snow. In the winter, the terrain is mostly covered with deep snow.

- Snow. The phosphorus in WP can burn undetected in snow for up to four days.
- Rocky terrain. Smoke is effective to deny the enemy the use of narrow passages, valleys, roads, and usable terrain.
- Winds. Swirling winds make smoke employment very difficult to adjust and maintain. Close coordination is required with adjacent elements to ensure that their vision is not obscured or they are not highlighted.
- Adjusting fire. Distances are difficult to judge. Observers tend to underestimate upslope distances and overestimate downslope distances.

Problems

Mortars are ideal because of their high-angle fire. They can deliver fire on reverse slopes and over intermediate crests.

Position observers on high ground and spread them to overcome terrain masks and compartments. Observers may require mountaineering equipment to get to the best positions, or they may be airlifted. Terrain sketches and visibility diagrams are essential to deliver fast, accurate fire and to identify blind spots.

Use ground surveillance radars and remote sensors to acquire targets. Use smoke to—

- Deny enemy use of narrow passages, valleys, roads, and usable terrain.
- Isolate enemy formations for piecemeal destruction.
- Obscure routes that can be used by the enemy to attack, withdraw, and resupply.
- Obscure likely position areas for indirect fire assets, command and control elements, CSS assets, and observation posts.
- Conceal terrain that is subject to snowslides, flash floods, and rockslides.

Jungles

Usually, jungle operations are carried out by light forces that can get into and out of areas by helicopter. Fire support may be limited to indirect fire and air support. Because small-unit operations are com-

monplace, greater challenges accrue to the chemical officers and fire support coordinators (FSCOORDs) at lower levels such as the company FSO and the battalion chemical officer.

Delivery Means

In jungle terrain, most contact with the enemy will be at extremely close ranges. If the friendly force has a substantial advantage in fire support, the enemy will most likely try to come in as close as possible and maintain that close contact so that the friendly force cannot employ their fire support advantage without inflicting casualties on their own troops.

In the triple-canopy jungle, HC smoke is ineffective. WP is effective as a marking round and in initial adjustments. ICM and FASCAM will hang up in the trees and endanger friendly forces that later move through the area. Illumination rounds are ineffective because the chutes get caught in the upper canopy.

The triple-canopy jungle makes observation beyond 25 to 50 meters very difficult. The jungle also makes map reading and self-location, target location, and friendly unit location determinations very difficult.

Problems

Experience from World War II and Vietnam showed that observers and smoke control officers must be able to adjust smoke and mortar and field artillery (FA) fire by sound because they often cannot see the rounds to adjust them. This sound adjustment is very difficult and requires wide experience.

By taking the recommended adjustments of two or more observers in different locations, some accuracy can result. The battery fire direction center (FDC) can help by announcing SPLASH to let the observer know when the round should impact. The observer then counts the seconds until he hears the round detonate. Multiplying the seconds by the speed of sound, the observer can estimate the range to impact. The speed of sound is approximately 350 meters per second. The speed of sound varies according to temperature, wind speed and direction, relative humidity, and air density; but 350 meters per second should be used as a start point.

The observer and smoke control officer must determine their locations and ensure that the TAC CP and FDC have them plotted. If the observer or smoke control officer's initial position locations are way off, the smoke will be way off too. Use the initial smoke to determine the observer's own location.

Vietnam and World War II also showed that the first projected round in adjustment must be WP smoke. Because the observers are not sure of their own location or that of other friendly elements, WP was always fired first to avoid inflicting casualties on friendly personnel.

Creeping fire was also used extensively in Vietnam and World War II. The observer adds 300 to 400 meters to his target location in case his own position location is wrong. Then he makes corrections of no more than 50 meters until the fire is on target. In Vietnam, this process sometimes started with an aerial observer and was taken over by the ground observer once he was able to see the rounds. The aerial observer was often required to relay fire requests from the ground because the terrain severely limited the ranges of radio communications.

Because of the close combat, laser range finders may not be of great use; however, night vision devices are extremely critical. Avoid using projected smokes during limited visibility periods to preclude degradation of these devices. Aerial observers help direct CAS assets against enemy targets. Because ground observers cannot see the whole battlefield, the aerial observer marks targets for the CAS sortie (flares, WP, smoke). Radars are extremely effective in the jungle, since most indirect fire is high-angle fire. Ground surveillance radars and remote sensors must be used.

Use smoke—

- To conceal maneuver to the front, flanks, and rear.
- Along roads and trails to deny enemy use.
- At likely ambush sites to obscure enemy observation and fields of fire.

Urban Terrain

In urban terrain, ranges are drastically reduced. There are three major types of terrain in nearly every built-up area:

- Obstructions, such as buildings and heavily wooded parks.
- Flat, open terrain over water, such as rivers and lakes.
- Flat, open terrain over concrete or asphalt, such as parking lots, multiple-lane roads and highways, and open lots.

Air currents are unpredictable. Obstructions tend to break up smoke streamers, which re-form into a more uniform cloud. Convection currents over open areas cause smoke to rise. There are many observation points at multiple levels, which allows an enemy to observe from either above or below smoke.

Delivery Means

Downwind coverage is often less due to obstructions breaking up the smoke, unpredictability of air currents, and smoke following street patterns. The Berlin Brigade observed that open areas in cities tend to cause smoke to rise and obscure key observation points. This is a particular problem over water, garden plots, and wide expanses of concrete.

Smoke diffuses well at night but tends to rise to rooftop level about one hour after sunrise until one hour after sunset. Burning rubble degrades the screening efficiency of smoke. Smoke pots weigh between 27.5 and 33 pounds (M4/M5), making it difficult for infantry squads to employ without transportation assets to move them forward first.

Smoke hand grenades make smoke for only 60 to 150 seconds. Squads need to carry four to six per person for concealment. Because of the height and closeness of buildings and other obstructions, CAS and artillery fire is degraded. Mortars and high-angle artillery are still effective.

Problems

Smoke and obscurant use in military operations on urbanized terrain (MOUT) requires careful planning and execution to prevent interference with movement, assault operations, or target acquisition; to retain the element of surprise; and to avoid silhouetting or drawing undue attention to friendly forces.

Time smoke delivery with decision points. Conduct a thorough IPB and time your use of smoke to key decision points in your tactical plan: for example, "When we reach Sector Al, use grenade launchers to smoke the open area and conceal movement of B Company as they emplace smoke pots.") Ensure you target key terrain to deny the enemy the use of it.

Use unobscured weapons to overwatch. The overwatching elements should have target acquisition devices such as thermal imagers that can see through our own smoke and engage the enemy. This prevents surprise and enhances your ability to suppress enemy fire during the assault. This is particularly important for observers in upper floors of buildings, enabling them to observe enemy movements while friendly forces move unobserved.

Limited visibility positions, preplanned and previously prepared, will minimize degradation caused by friendly or Threat use of smoke. Rehearsal of displacement under smoke will help you avoid confusion and disorientation. It will also rapidly restore engagement capability.

The best tactical application of smoke in urban areas is smoke blankets for concealment. Use smoke blankets prior to assaults. Sweep and clear operations to eliminate enemy forces acquiring our soldiers as targets. This is exceptionally effective in reducing or eliminating sniper activity and in breaching obstacles. However, your soldiers must be careful to avoid burning debris since this tends to reduce concealment.

Plan for enemy countermeasures. Enemy forces will counter your smoke use. Plan to intensify your counterreconnaissance and air defense efforts. The enemy may use countersmoke to confuse our command and control so avoid reliance on visual signals.

The enemy will increase use of indirect fire weapons when direct fire target acquisition is ineffective. Therefore, plan artillery counterbattery or countersmoke fire after crossing the LD/LC.

Reconnaissance must verify enemy locations. The enemy can use both our smoke and theirs to conceal movement to alternate positions or to break contact. Aggressive reconnaissance before and during the engagement will allow you to shoot and remain in contact.

Understand that smoke compresses the battlefield by limiting visibility. Smoke drastically reduces engagement ranges. Training your soldiers to operate in smoke reduces the degradation caused by smoke. It also reduces psychological impact on troops such as confusion, fear, and isolation. The Israeli Army successfully used phosphorous rounds in Beirut to screen their forces and isolate the enemy (enemy forces tended to congregate in the city). The use of smoke produced enemy casualties and generated the psychological effects of fear and isolation.

Urban terrain causes smoke streamers to break up quickly, creating the uniform phase closer to the smoke source. You can place smoke sources closer to target areas.

Ensure the entire squad, section, or platoon uses the smoke simultaneously to preclude drawing attention to a lone vehicle or element. Smoke pots and smoke grenades are effective for concealing movement of small units. An example of an employment scenario follows:

Squad members come under fire from snipers in upper floors. They use a grenade launcher to fire smoke and HE rounds into upper floors, blinding enemy observation. They emplace HC smoke pots or several smoke hand grenades downwind of and in between themselves and the target area or building. Concealed by the smoke, they maneuver to assault the target. Upon reaching the target area, they cease to make smoke to allow them to operate undegraded.

Start the smoke mission prior to operation start time and continue well beyond the end of the operation. For example, you have planned a canal crossing for 0500 to 0700 hours. Start smoke at 0400. Stop smoke at 0800 to confuse the enemy as to the exact crossing time and size of the force.

Built-up areas nearly always have civilians/noncombatants occupying them. When planning the type of smoke weapon system, and you suspect noncombatants are present, give consideration to the lethality of the system before employment. For example, artillery-delivered smoke is useful around the periphery of a city. However, you should switch to less devastating systems in the center of the city, such as smoke munitions from grenade launchers, smoke pots, and smoke hand grenades.

Smoke units are extremely vulnerable in urban areas due to smoke generator signature. In addition, stationary smoke positions need to be closer to the target than over other terrain, bringing smoke generator elements within range of enemy small arms weapons. Mobile smoke systems are best. Stationary smoke systems make large volumes of smoke but require additional security support. Employ smoke generator vehicles in groups of three, with two vehicles making smoke and one vehicle overwatching.

Deserts

There are three types of deserts:
- Rocky plateau deserts.
- Sandy or dune deserts.
- Mountain deserts. (Munitions effectiveness for mountain deserts is the same as for any mountainous region except that the considerations of snow are usually not applicable.)

It is important to recognize the specific terrain of each, because munitions effects will vary according to desert type. Desert battles tend to be more centralized. Brigade and battalion commanders often personally coordinate the interaction of maneuver and firepower. Engagements are often fought at long ranges.

In rocky plateau deserts, projected smoke and illumination rounds may be degraded by high winds, but may be used to silhouette the enemy. HE/PD is extremely effective, creating extra shrapnel by splintering rocks. FASCAM is very effective and should be employed with smoke and the natural terrain to force the enemy into unnavigable terrain.

In sandy or dune deserts projected smoke and illumination rounds are effective and can be used to silhouette the enemy. HE, PD, ICM, FASCAM, and delay are smothered by deep sands, making them ineffective.

Location determination is often very difficult in rocky plateau and sandy or dune deserts. Maps are often inaccurate, dunes shift, and heat waves hamper distance estimations. The Israelis help forward elements determine their own location by using artillery survey teams at two or more points, putting searchlights on those points, and, upon request, shooting a beam of light into the air. The forward observer can then shoot an azimuth to the beams of light and perform a map resection. The beam of light must project straight up, and the observer must shoot an azimuth at the lowest visible point on the beam. With this system, pyrotechnics may also be shot into the air. The use of marking rounds as discussed for jungle operations also can help forward units self-locate.

Laser range finders must be used, especially when heat waves degrade distance estimating by conventional means. Observers can detect targets by observing dust clouds created by moving enemy forces. Employ smoke behind the enemy to silhouette them. The similarity of colors in the desert makes specific targets hard to spot. At night, illumination rounds burning on the ground behind the enemy have the same effect.

Usually, air observation is highly productive; however, the absence of landmarks in some areas degrades this capability. This problem is enhanced because aerial observers tend to see the battlefield in a two-dimensional perspective.

Lack of trees and hills makes aircraft more vulnerable to enemy air defenses. Use smoke to force enemy aircraft to fly higher, making acquisition easier. Radars are highly effective in the desert. Use them to aid in adjusting smoke onto targets.

Use smoke to—
- Complement ICM and FASCAM for obstructing and denying enemy use of roads.
- Silhouette the enemy, complement illumination fire at night, and increase the background contrast for sensors to acquire targets.

Priority targets for HC and WP smoke munitions and for generator smoke are likely enemy OPs, ATGM systems, and enemy air defense systems.

Winter Zones

The extreme weather conditions in arctic and subarctic regions are dramatic and severely impact on observation, mobility, and delivery of fire. Specific weather phenomena with which the smoke and fire support personnel must be concerned include whiteout, greyout, and ice fog.

Whiteout. The observer appears to be in a uniformly white glow. Neither shadows, horizon, nor clouds are discernible. The sense of depth and orientation is lost. Only very near, dark objects can be seen. Whiteouts occur over an unbroken snow cover and beneath a uniformly overcast sky. Blowing snow can cause the same effect.

Greyout. This is similar to whiteout except the horizon is distinguishable under greyout conditions. It occurs over a snow-covered surface during twilight conditions or when the snow is close to the horizon. There is an overall greyness to the surroundings. When the sky is overcast with dense clouds, there is an absence of shadows, resulting in a loss of depth perception.

Ice fog. This is common around inhabited areas during cold weather below 35 degrees Fahrenheit. Water vapor created by humans and vehicle exhausts may appear around soldier and equipment concentrations. Ice fog obscures vision and discloses locations by presenting a visible cloud to the enemy.

In winter zones, HC smoke and generator smoke are effective, and colored smoke may be used to silhouette the enemy. However, some of the canisters may be smothered in the deep snow. WP is effective; however, phosphorus may burn undetected in the snow for up to three to four days and may be a hazard to friendly troops subsequently moving through the area. HE/PD, HE/delay, ICM, and FASCAM are ineffective in deep snow. At least 40 percent of the blast from these munitions is smothered by the snow.

Weather and terrain conditions cause disorientation; changing terrain and poor maps make self-location difficult. Use marking rounds or searchlights and pyrotechnics from surveyed positions to help observers and smoke control officers orient themselves. Bright sunlight reflecting off snow-covered landscape causes snow blindness. Amber filters on binoculars and ob-

servation devices reduce the incidence of snow blindness.

Use of laser range finders is extremely critical because of lack of depth perception due to weather and terrain conditions. Use limited visibility positions to prevent degrading these systems. Use aerial observers because they can see deep and are not as prone to disorientation as are ground observers. Frequent poor weather reduces availability of CAS. Plan smoke use from CAS aircraft during windows of opportunity for good weather.

NBC Conditions

The physiological and psychological effects of NBC conditions impact on all elements of combat power. These conditions, documented in FM 3-100, create special problems when either the enemy or friendly force use smoke and obscurants. Encapsulation in full, individual protective equipment significantly reduces a soldier's ability to—

- **See.** Peripheral vision and visual acuity are restricted. Observers and smoke control officers are not able to accurately judge smoke on target or to estimate ranges for adjustments.
- **Hear.** Hearing is degraded. This is a significant problem on certain terrain, such as jungles, where fire and smoke are adjusted by Sound.
- **Communicate.** Communication is more difficult, as speakers and listeners often perceive that they cannot enunciate or hear as well. This has significant impact on adjusting fire or positioning smoke units.
- **React to stress.** Sustained operations are much more difficult, as encapsulation severely taxes human bodies. Leaders are at the greatest risk of combat ineffectiveness.

Deception

Employed smoke draws attention to the area it covers. This characteristic makes smoke use significant in supporting the deception story. However, never plan to use smoke by itself for deception.

Tactical deception draws the enemy's attention from the area of the main attack. The object is to make the enemy commit forces to the deception and not the main attack.

Smoke supports tactical deception operations by—

- Drawing attention to the deception activity.
- Limiting the enemy's ability to identify the deception for what it is: a ruse, feint, or demonstration.
- Protecting the force performing the deception.
- Making two-dimensional decoy material look real.

Planners must provide enough resources so that smoke support for the deception mission lasts as long as the deliberate mission. The key to a successful smoke deception is to make the enemy believe that the smoke support is for the main effort. However, smoke support for the deception force should not be so large that it divides or degrades the effectiveness of support for the main effort.

Plan to attack the deception target just as you would in any other operation. The standard battlefield applications of smoke—screening, obscuring, protecting, or marking-all apply. Use smoke to obscure, screen, protect, or mark a dummy or imaginary tactical smoke target area. Both the deliberate and deception mission should have the same visibility requirement and resources. Plan to use projected smoke extensively.

Planning considerations include–

- Ensure you place smoke on similar targets for both the main effort and deception. Deception and main effort smoke target areas should be Similar in size.
- Shift smoke assets to the main effort only when assaulting the objective and when immediate smoke is required to protect an element of the main effort.